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(54) WELDED STEEL PIPE WITH LOW YIELD RATIO, AND ITS PRODUCTION

(57)Abstract:

PROBLEM TO BE SOLVED: To obtain a welded steel pipe with low yield ratio, having sound weld zone, by constituting the steel pipe of a low alloy steel of specific composition containing specific amounts of Cr, providing a structure composed of dual-phase structure of hard phase and soft phase, and regulating the yield ratio to specific values according to the value of (wall thickness)/(outside diameter).

$t/D \leq 2$ のとき, $YR \leq 80\%$
 $2 < t/D \leq 3$ のとき, $YR \leq 85\%$
 $t/D > 3$ のとき, $YR \leq 88\%$
ただし,
 t : 鋼管の肉厚 (mm)
 D : 鋼管の外径 (mm)

SOLUTION: A steel, having a composition consisting of, by weight, 0.03-0.3% C, 0.05-1% Si, 0.3-2% Mn, $\leq 0.03\%$ P, $\leq 0.02\%$ S, 1-3% Cr, 0.005-0.1% sol-Al, 0-1.5% Mo, 0-0.1% Nb, 0-0.5% V, 0-0.1% Ti, 0-2% Cu, 0-2% Ni, 0-0.005% B, and the balance Fe with inevitable impurities, is hot-rolled. At this time, rolling and cooling conditions are regulated to form a dual-phase structure containing soft ferritic phase and hard bainitic or martensitic phase. The resultant hot rolled steel plate is formed into open pipe shape, and both end faces are subjected to pipe welding by laser beam. Then, post-heating treatment is applied to the weld metal zone and the weld heat-affected zone, and the welded steel pipe having yield ratio YR satisfying inequalities can be obtained.